

TIMBER SALE MAP

SALE NAME:

BRAIN STRAIN

AGREEMENT NO:

30-075799

TRUST(S):

FOREST BOARD TRANSFER & COMMON SCHOOL

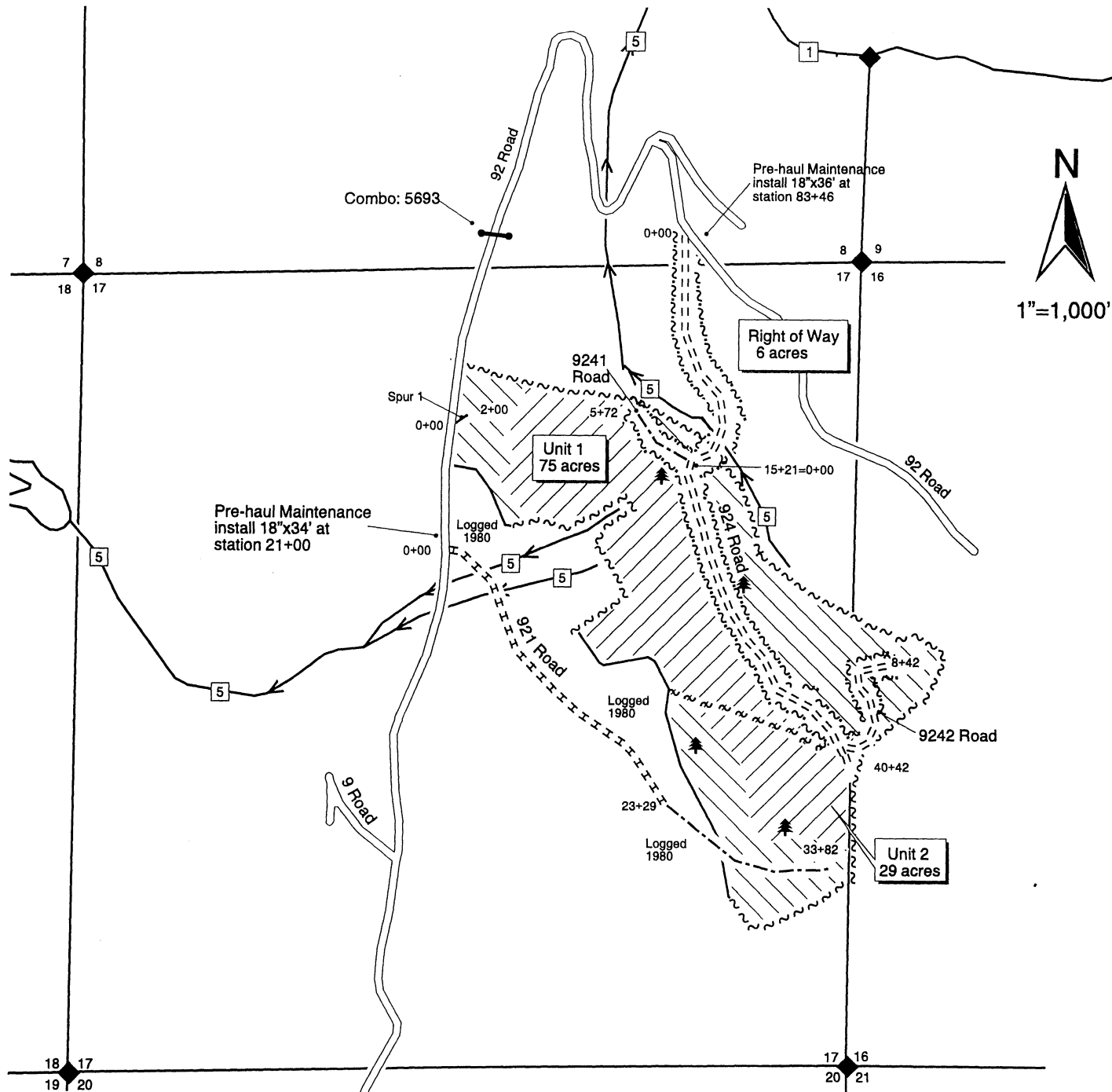
REGION:

SOUTH PUGET SOUND

COUNTY(S):

PIERCE

ROAD PLAN PROJECT MAP
Township 15 North, Range 6 East, W.M.



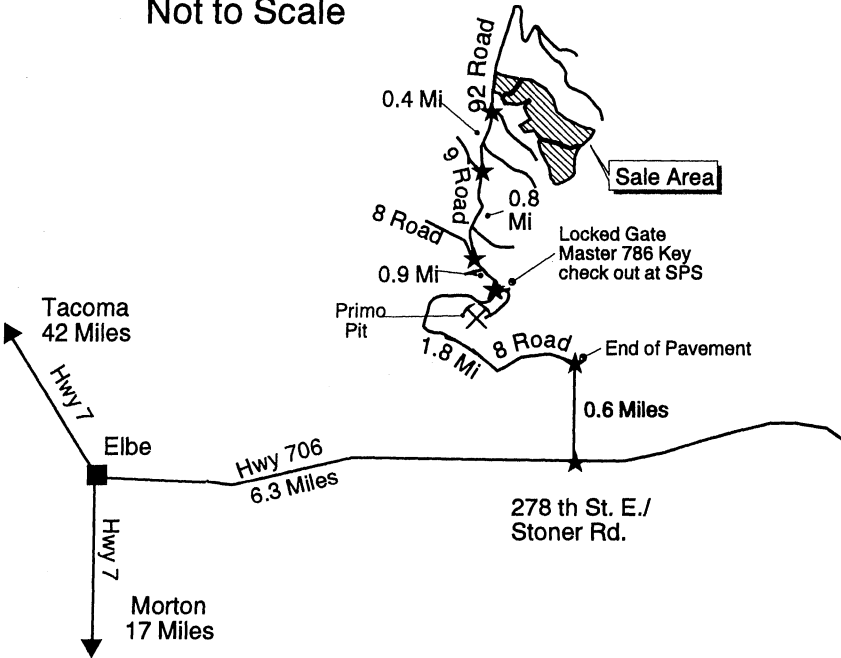
Elevation Range: 2,600 - 3,200 feet

LEGEND

- ~~~~~ White Timber Sale Boundary Tags
- ~~~~~ Blue Special Management Unit Boundary Tags
- ~~~~~ Orange Right of Way Boundary Tags
- * Leave tree areas marked with Yellow Leave Tree Area tags
- [Hatched Box] Cable
- [Hatched Box] Ground based
- ==== Existing Road
- Required Construction
- Optional Construction
- Optional Reconstruction
- Stream
- * Water Type Break
- [3] Water Type
- X Rock Pit

Drawn By: A. Stuart
Date: March 9, 2004

VICINITY MAP
Not to Scale



STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES
SOUTH PUGET SOUND REGION

BRAIN STRAIN

ROAD PLAN

SECTIONS 16 and 17, TOWNSHIP 15 NORTH, RANGE 6 EAST, W.M.
PIERCE COUNTY

RAINIER DISTRICT

AGREEMENT NO.: 30-075799

STAFF ENGINEER: M. Bell

DATE: 2/9/04

DRAWN & COMPILED BY: M. Bell

SECTION 0 - SCOPE OF PROJECT

This project includes but is not limited to construction and optional construction including:

- clearing;
- grubbing;
- right-of-way debris disposal;
- excavation and/or embankment to subgrade;
- landing construction;
- acquisition and installation of drainage structures;
- acquisition, manufacture, and application of rock;
- grass seeding;
- road deactivation;
- road abandonment.

This project also includes but is not limited to optional reconstruction including:

- brushing right-of-way;
- clearing existing excavation and embankment slopes;
- right-of-way debris disposal;
- pulling ditches;
- cleaning ditches;
- constructing ditches;
- acquisition and installation of additional drainage structures;
- grading and shaping existing road surface and turnouts;
- compaction of road surface;
- acquisition, manufacture, and application of rock including existing turnouts;
- road deactivation.

This project also includes but is not limited to pre-haul maintenance including:

- constructing catch basin and headwall;
- acquisition and installation of additional cross drain culverts.

SECTION 1 - GENERAL CLAUSES

1.1-1 ROAD PLAN SCOPE

Clauses in this plan apply to all construction, reconstruction, or pre-haul maintenance including landings unless otherwise noted.

1.1-2 REQUIRED ROADS

Construction or pre-haul maintenance of the following roads is required. All roads shall be constructed on the State's location and in accordance with this Road Plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
92	21+00	Pre-haul Maintenance
92	83+46	Pre-haul Maintenance
924	0+00 to 40+42	Construction
9242	0+00 to 8+42	Construction

1.1-3 OPTIONAL ROADS

Construction or reconstruction of the following roads is not required. Roads used by the Purchaser shall be constructed or reconstructed on the State's location and in accordance with this Road Plan.

<u>Road</u>	<u>Stations</u>	<u>Type</u>
921	0+00 to 23+29	Reconstruction
921	23+29 to 33+82	Construction
9241	0+00 to 5+72	Construction
Spur 1	0+00 to 2+00	Construction

1.1-4 ROAD PLAN CHANGES

Any departure from this Road Plan including relocation, extension, change in design or additional roads shall be submitted in writing, to the Contract Administrator for consideration, submitted plans must be approved before construction begins.

1.1-5 HIDDEN CONDITIONS

On this plan quantities are minimum acceptable values. Additional quantities required by the State because of hidden conditions or Purchaser's choice of construction season or techniques shall be at the Purchaser's expense. Hidden conditions include, but are not limited to: solid subsurface rock, subsurface springs, saturated ground, and unstable soil.

1.2-1 CONSTRUCTION PERIOD

The construction, reconstruction, pre-haul maintenance, or rock haul on any of the roads specified herein shall not be permitted when in the opinion of the Contract Administrator, excessive damage may occur, nor shall it be permitted from November 1 to May 31 unless authority to do so is granted, in writing, by the Contract Administrator.

1.2-1C DAILY CONSTRUCTION TIME

No operation of road construction equipment will be allowed on weekends or State recognized holidays unless authority to do so is granted in writing by the Contract Administrator.

1.2-2 HAUL APPROVAL

Purchaser shall not use roads constructed, reconstructed, or pre-haul maintained under this Road Plan for hauling, other than timber cut on the right-of-way, without written approval from the Contract Administrator.

1.2-3 EXCAVATOR CONSTRUCTION

Roads shall be constructed or reconstructed using track mounted hydraulic excavators unless otherwise authorized, in writing, by the Contract Administrator.

1.2.1-1 CONSTRUCTION STEPS

Pioneering shall not extend past construction that will be completed during the current construction season. Drainage shall be provided on all uncompleted construction as approved, in writing, by the Contract Administrator. Road pioneering operations shall not undercut the final cut slope, deposit excavated material outside the right of way limits, or restrict drainage.

Clearing and grubbing shall be completed prior to starting excavation and embankment.

Culvert placement in live streams shall precede embankment where culverts are to be placed along natural ground.

Culverts shall be installed in completed subgrade as construction progresses.

Subgrade, ditches, culvert installations, and subgrade compaction shall be completed and are subject to written

approval by the Contract Administrator prior to rock application, and/or timber haul.

1.3-1A CLOSURE TO PREVENT ROAD DAMAGE

At any time of the year, the hauling of forest products shall not be permitted when in the opinion of the Contract Administrator excessive road damage may occur.

1.4-3 R P DAMAGE

Reference points (R.P.'s) that are moved or damaged at any time during construction shall be reset in their original locations by the Purchaser. Excavation and embankment shall not proceed on road segments controlled by said R.P.'s until all moved or damaged R.P.'s are reset.

1.5-1 ROAD MAINTENANCE RESPONSIBILITY

Maintenance on roads listed in Contract Clauses C-50 (Purchaser Road Maintenance and Repair) and C-60 (Designated Road Maintainer) shall be performed in accordance with Forest Access Road Maintenance Specifications.

1.5-3 SNOWPLOWING

Snowplowing shall not be permitted unless authorized, in writing, by the Contract Administrator.

SECTION 2 - CLEARING

2.1-1 CLEARING SPECIFICATION

Fell all vegetative material larger than 6 inches DBH or over 20 feet high between the marked right-of-way boundaries or if not marked in the field, between clearing limits specified on TYPICAL SECTION SHEET.

SECTION 3 - GRUBBING

3-1 GRUBBING SPECIFICATIONS

All stumps shall be removed that fall between grubbing limits shown on the TYPICAL SECTION SHEET. Those outside the grubbing limits but with undercut roots shall also be removed.

3-2 GRUBBING LIMITS

Grubbing limits are defined as the entire area between the external limits shown on the TYPICAL SECTION SHEET.

SECTION 4 - DEBRIS DISPOSAL AND REMOVAL

4.1-1 DEBRIS DEFINITION

Right-of-way debris is defined as all non-merchantable vegetative material larger than one cubic foot in volume within the clearing limits.

4.1-2 DISPOSAL COMPLETION

All right-of-way debris disposal shall be completed prior to the application of rock and/or timber haul.

4.2.3-3 DEBRIS PLACEMENT

Right-of-way debris shall not be placed against standing timber.

4.2.3-4 SCATTERING RIGHT OF WAY DEBRIS

Right-of-way debris shall be scattered outside the right-of-way clearing limits in natural openings.

4.3-1 BRUSHING

On the following road, vegetative material including limbs up to 3 inches in diameter shall be cut to 5 feet beyond the back of the ditch and 5 feet beyond the outer edge of the subgrade and to a height of 14 feet above the road surface. Vegetative material shall be cut as near flush with the ground as possible, but shall not extend more than 3 inches above the ground.

<u>Road</u>	<u>Stations</u>
921	0+00 to 23+29

SECTION 5 - EXCAVATION

5.1-1 DEFAULT ROAD DIMENSIONS

Unless controlled by specific design sheets herein, roads shall be constructed or reconstructed in accordance with dimensions shown on the TYPICAL SECTION SHEET.

5.1-3 ROAD GRADE AND ALIGNMENT

Road grade and alignment shall conform to the State's marked location. Grade and alignment shall have smooth continuity without abrupt changes in direction. Maximum grades are: 18 percent favorable and 12 percent adverse or as specified on drawings. Minimum radius curve is 60 feet.

5.1-4 CURVE WIDENING

Minimum extra widening on the inside of curves shall be:

5 feet extra	80 to 100 foot radius curve
7 feet extra	60 to 80 foot radius curve

Curve widening, where required, shall be added to the inside of curves.

5.1-7 CONSTRUCTION TOLERANCES

Roads shall be constructed or reconstructed to the dimensions shown on the TYPICAL SECTION SHEET, within the tolerance listed below. Tolerance classes for each road are listed on the TYPICAL SECTION SHEET.

<u>Tolerance Class</u>	<u>A</u>	<u>B</u>	<u>C</u>
Road Width (feet)	+1.5	+1.5	+2.0
Subgrade elevation (feet +/-)	0.5	1.0	2.0
Centerline alignment (feet lt./rt.)	1.0	1.5	3.0

5.1-8 CUT SLOPE RATIO

Excavation (cut) slopes shall be constructed no steeper than shown on the following table except as designed:

<u>Material Type</u>	<u>Excavation Slope Ratio</u>	<u>Percent</u>
Common Earth (on side slopes less than 55%).....	1:1	100
Common Earth (55% to 70% sideslopes)	¾:1	133
Common Earth (on slopes over 70%).....	½:1	200
Fractured or loose rock	½:1	200
Hardpan or solid rock.....	¼:1	400

5.1-9 SHAPING CUT SLOPE

Excavation and embankment slopes shall be constructed to a uniform line and left rough for easier re-vegetation.

5.1-10 FILL WIDENING

Embankments shall be widened as follows:

<u>Height at Shoulder</u>	<u>Subgrade Widening</u>
Less than 6 feet	2 feet
6 feet or over	4 feet

5.1-11 FILL SLOPE RATIO

Embankment (fill) slopes shall be constructed no steeper than shown on the following table except as designed:

<u>Material Type</u>	<u>Embankment Slope Ratio</u>	<u>Percent</u>
Common Earth and Rounded Gravel	1½:1	67
Angular Rock	1¼:1	80
Sandy Soils.	2:1	50

5.1-12 DISPOSAL OF ORGANIC DEBRIS

Organic material shall be excluded from embankment.

5.1-14 FULL BENCH CONSTRUCTION

Where side slopes exceed 45 percent, full bench construction shall be utilized for the entire subgrade width or designed.

5.1-15 END HAUL CONSTRUCTION

Waste material may be deposited adjacent to the road prism on side slopes up to 55 percent if the waste material is compacted. On side slopes of 55 percent or more, all excavation shall be end hauled or pushed to designated embankment sites. All waste embankments shall be compacted in horizontal layers not exceeding 2 feet.

5.1-22 PROHIBITED DISPOSAL AREAS

Waste material shall not be deposited within 100 feet of a culvert installation, live stream, Riparian Management Zone, wetland or Wetland Management Zone.

5.1-23 TURNOUTS

Turnout locations noted on this plan are approximate. Locations shall be adjusted to fit with final subgrade alignment and sight distances. Location shall be subject to written approval of the Contract Administrator.

5.3-1 FILL COMPACTION

All embankment and waste material shall be compacted. The minimum acceptable compaction is achieved by placing embankments in 2 foot or shallower lifts and routing excavation equipment over entire width of the lifts. Side hill embankments too narrow to accommodate excavation equipment may be placed by end-dumping or side casting until sufficiently wide to support the equipment.

5.5-4 SUBGRADE COMPACTION

Constructed or reconstructed subgrades shall be compacted full width except ditch prior to rock application. Compaction shall be by a smooth-drum vibratory roller weighing at least 20,000 pounds. Four complete passes shall be made at a maximum operating speed of 3 mph.

5.5-5 SUBGRADE CROWN

Finished subgrade shall be crowned or outsloped as shown on the TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

SECTION 6 - DRAINAGE

6.2.1-1A TEMPORARY CULVERTS

On optional roads, Purchaser shall furnish, install and maintain temporary culverts of the length and diameter specified on the CULVERT LIST. Culverts may be new or used steel, plastic, concrete, or such other material as approved by the Contract Administrator. All said culverts shall be removed from the road bed and State Land as indicated in clause 10.1-1.

6.2.1-1B POLYETHYLENE AND ALUMINIZED REQUIRED

Purchaser shall furnish, install, and maintain corrugated polyethylene pipe (AASHTO specification No. M-294 Type S) and on culverts over 24 inches, aluminized culverts (meeting ASTM A 819, AASHTO M-274 aluminized steel Type 2 and AASHTO M-36 specifications) as designated on the CULVERT LIST. Culvert and flume lengths shall be varied to fit as-built conditions subject to written approval by the Contract Administrator.

6.2.1-2 CULVERT BANDS

Annular corrugated bands and culvert ends shall be used on metal culverts. On culverts over 24 inches, bands shall have a minimum width of 24 inches. Manufacturer's approved connectors shall be used for corrugated polyethylene pipe.

6.2.1-5 REQUIRED CULVERTS STATE PROPERTY

On required roads: culverts, downspouts, flumes, bands, and gaskets as listed on the CULVERT LIST which are not installed shall become property of the State.

6.2.1-5A CULVERT REMOVAL

Metal, concrete, or plastic culverts and bands removed from the roadbed as listed in the CULVERT LIST shall be removed from State land prior to termination of this contract.

6.2.2.1-1 CULVERT SPECIFICATIONS

Culvert, downspout, flume, and energy dissipator installation shall be in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL and the National Corrugated Metal Pipe Association "Installation Manual for Corrugated Steel Drainage Structures".

6.2.2.2-1 **ALUMINIZED DAMAGE REPAIR**

Any damaged aluminized coating or cut ends shall be retreated with a minimum of 2 coats of zinc rich paint.

6.2.2.3-1 **CROSS DRAIN SKEW**

Cross drains and surface culverts on road grades in excess of 3% shall be skewed at least 30 degrees from perpendicular to the road centerline, except cross drain culverts at the low points of dips in roads shall not be skewed.

6.2.2.3-2 **CULVERT SLOPE**

Cross drain culverts shall be installed at a slope steeper than the incoming ditch grade, but not less than 3% nor more than 10%.

6.2.2.4-1 **CULVERTS REQUIRING WRITTEN APPROVAL**

Installations of culverts 30 inches in diameter and over shall be subject to written approval by the Contract Administrator prior to making backfill.

6.2.2.5-1 **ENERGY DISSIPATORS**

Drainage structure outfalls shall not terminate directly on unprotected soil that will erode. Downspouts, flumes, and energy dissipators shall be installed to prevent erosion.

6.3-1 **DITCH CONSTRUCTION**

Ditches shall be constructed concurrently with construction of the subgrade. Ditches shall drain to culverts, ditchouts, and natural drainages.

6.3-2 **DITCH, HEADWALL, AND CATCHBASIN CONSTRUCTION**

Shaping the ditchline, culvert headwalls, and catch basins shall be completed prior to application of rock and/or timber haul and shall be done in accordance with the TYPICAL SECTION SHEET and CULVERT AND DRAINAGE SPECIFICATION DETAIL.

6.3-2E **DITCH MAINTENANCE**

On the following road, the Purchaser shall pull the ditches, reshape all culvert headwalls and catch basins, and clean the inlet and outlet of all culverts. Work shall be completed prior to grading and compaction of the existing surface, and application of rock and/or timber haul and shall be done in accordance with the TYPICAL SECTION SHEET and CULVERT AND DRAINAGE SPECIFICATION DETAIL.

<u>Road</u>	<u>Stations</u>
921	0+00 to 23+29

6.4-1 **CATCH BASINS**

Catch basins shall be constructed to resist erosion in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL. Minimum dimensions: two feet wide and four feet long with backslopes consistent with Clause 5.1-8: Excavation Slopes.

6.5-1 **HEADWALLS**

Headwalls shall be constructed in accordance with CULVERT AND DRAINAGE SPECIFICATION DETAIL at all cross drain culverts.

SECTION 7 - ROCK

7.1-1 ROCK SOURCES

Rock for construction and/or reconstruction under this contract may be obtained from a source on State land as listed below at no charge to the Purchaser. Development and use shall be in accordance with a written "Development Plan" prepared by the State. Upon completion of operations, the rock source shall be left in the condition specified in said plan, subject to approval by the Contract Administrator. Use of material from any other source must have prior written approval from the Contract Administrator. If other operators are using or desire to use this rock source, a joint operating plan shall be developed. All parties shall follow this plan.

<u>Source</u>	<u>Location</u>	<u>Type</u>
Primo Pit	NE ¼ SW ¼ Section 20 Township 15 North Range 6 East, W.M.	4 Inch In Place

7.1-4 APPROVED ROCK SOURCES

All pit operations shall be conducted as directed by the Contract Administrator.

7.2.1.1-8 4-INCH IN PLACE

"4-INCH IN PLACE" rock shall have a minimum of 90 percent of the top 4 inches of the running surface pass a 4-inch square opening. In place processing such as grid rolling, jaw crushing, or such other method as is demonstrated by the Purchaser to be effective, shall be required if necessary to achieve this requirement.

7.2.1.2-2 DEBRIS IN ROCK

Manufactured run rock shall contain no more than 5 percent by weight of vegetative debris, dirt, or trash.

7.2.4-1 DRILLING AND SHOOTING SPECIFICATION

Rock drilling and shooting shall meet the following specifications:

- a. Oversize material remaining in the rock source at the conclusion of the timber sale shall not exceed 5 percent of the total volume mined for the sale.
- b. Oversize material is defined as rock fragments larger than two feet in any dimension.
- c. The Purchaser shall submit an informational drilling and shooting plan to the Contract Administrator 5 working days prior to any drilling.

7.4.1-1 GEOTEXTILE WIDTH

On the following road, Purchaser shall provide and apply geotextile to the subgrade to a width that is 2 feet more than the road width including turnouts.

<u>Road</u>	<u>Stations</u>
924	10+90 to 14+90

7.4.1-2 GEOTEXTILE SPECIFICATION

Geotextile shall be of non-woven type weighting at least 4-oz/sq. yd. and designed by the manufacturer to be used for subgrade restraint and separation. Installation of the fabric shall be in accordance with the manufacturer's specifications.

7.4.2-1 MINIMUM ROCK

Apply at least the minimum required rock quantity as shown on ROCK LIST. Required and optional rock shall meet the specifications on the ROCK LIST.

7.4.2-2 SUBGRADE APPROVAL FOR ROCK

Subgrade shall be approved, in writing, by the Contract Administrator prior to application of rock.

7.4.2-3B GRADING AND COMPACTING

On the following road, a grader shall be used to shape the existing surface and surface shall be compacted full width except ditch by four coverages with a smooth-drum vibratory roller weighing at least 20,000 pounds and at a maximum operating speed of 3 mph.

<u>Road</u>	<u>Stations</u>
921	0+00 to 23+29

7.4.2-3D GRADING AND SUBGRADE COMPACTION

On the following roads, a grader shall be used to shape the subgrade prior to subgrade compaction.

<u>Road</u>	<u>Stations</u>
921	23+29 to 33+82
924	0+00 to 40+42
9242	0+00 to 8+42

7.4.2-5 ROCK OVER GEOTEXTILE

Rock shall be applied in one lift over geotextiles in accordance with manufacturer's specifications.

7.4.2-7 ROCK FOR WIDENING

Turnouts and curve widening shall have rock applied to the same depth and specifications as the traveled way.

7.4.2-8 ROCK SHAPING

Each lift of rock shall be crowned or outsloped as shown on TYPICAL SECTION SHEET, and shall be uniform, firm, rut-free, and shaped to ensure surface runoff in an even, unconcentrated manner.

7.4.3-2 ROCK COMPACTION

Rock shall be spread and compacted full width in lifts each not to exceed 12 inches uncompacted depth. Compaction shall be by smooth drum vibratory roller weighing at least 20,000 pounds. Four complete passes at a maximum speed of 3 mph shall be made on each lift.

SECTION 9 - ROAD AND LANDING DEACTIVATION

9.1-1 ROAD DEACTIVATION

If constructed or reconstructed, the following road and all landings shall be deactivated by the Purchaser at the termination of use.

<u>Road</u>	<u>Stations</u>
921	0+00 to 33+82

9.1-2

Deactivation shall consist of:

- Construction of tank trap barrier in conformance with the attached SINGLE TANK TRAP DETAIL;
- Constructing drivable water bars in conformance with the attached DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 400 feet;
- Skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
- Keying water bars into ditchline;
- All work shall be completed as directed by the Contract Administrator.

9.2-1 LANDING DEBRIS

Purchaser shall reduce or relocate debris generated by road and landing construction, in a manner approved, in writing, by the Contract Administrator, to avoid landing failures and potential debris slides.

9.2-2 LANDING DRAINAGE

Purchaser shall provide for drainage of the landing surface as approved by the Contract Administrator.

SECTION 10 - ROAD AND LANDING ABANDONMENT

10.1-1 ABANDONMENT

If constructed, the following roads shall be abandoned by the Purchaser at the termination of use.

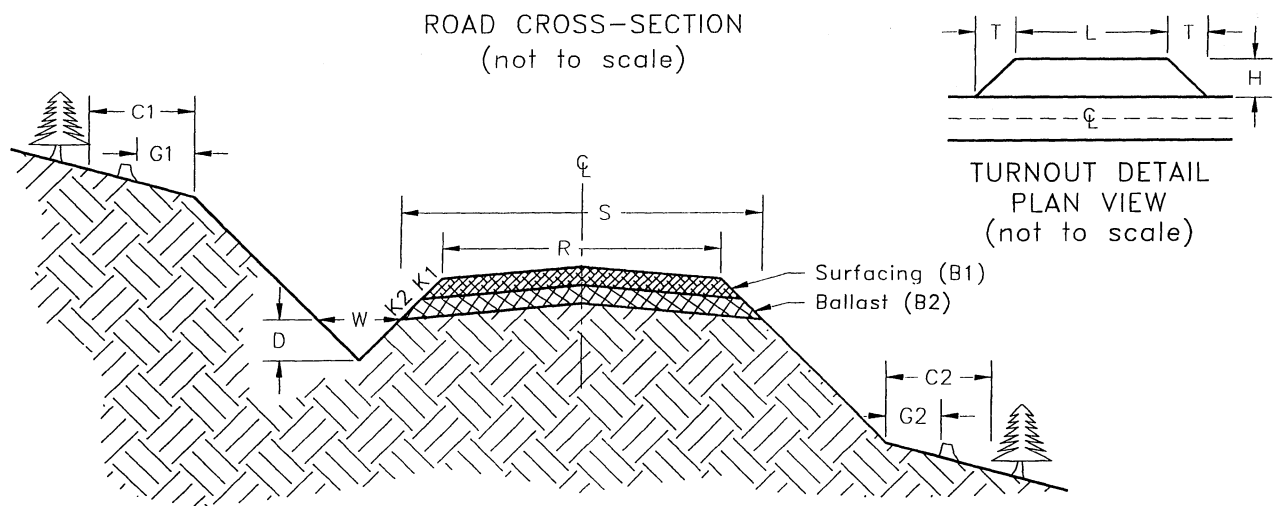
<u>Road</u>	<u>Stations</u>
9241	0+00 to 5+72
Spur 1	0+00 to 2+00

10.1-1A

Abandonment shall consist of:

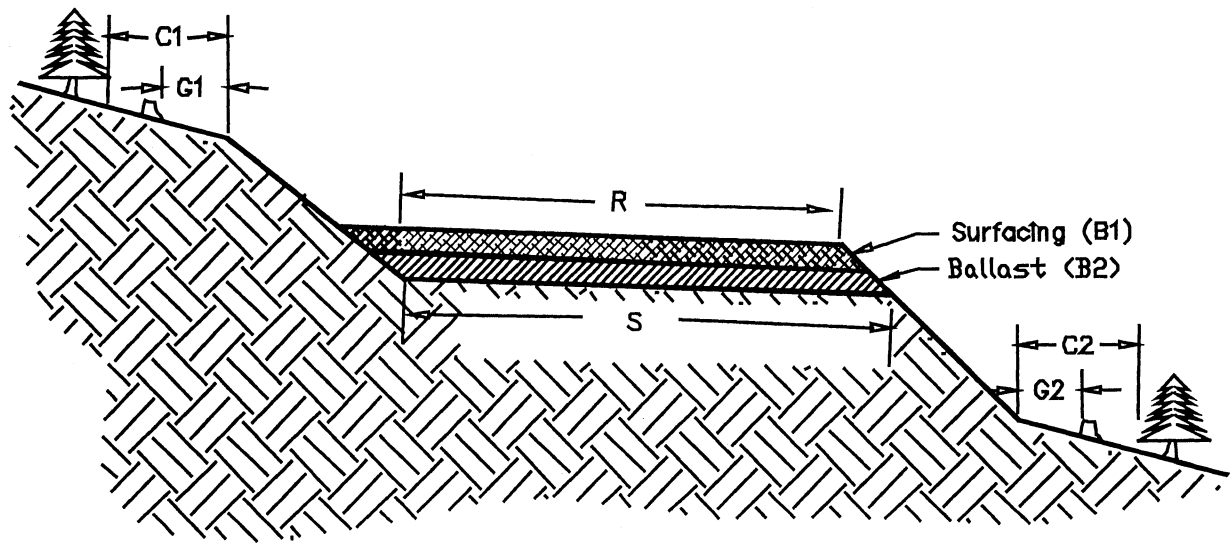
- Constructing non-drivable water bars in conformance with the attached NON-DRIVABLE WATER BAR DETAIL at a maximum spacing which will produce a vertical drop of no more than 10 feet between water bars or between natural drainage paths and with a maximum spacing of 100 feet;
- Skewing water bars at least 30 degrees from perpendicular to the road centerline on roads in excess of 3% grade;
- Keying water bars into ditchline;
- Construction of tank trap barriers in conformance with the attached SINGLE TANK TRAP DETAIL;
- Removing ditch cross drain culverts and leaving the resulting trench open;
- Sloping all trench walls and approach embankments no steeper than 1.5:1;
- Removing culverts from State Land;
- Scattering stumps and slash over the road prism;
- All work shall be completed as directed by the Contract Administrator.

TYPICAL SECTION SHEET

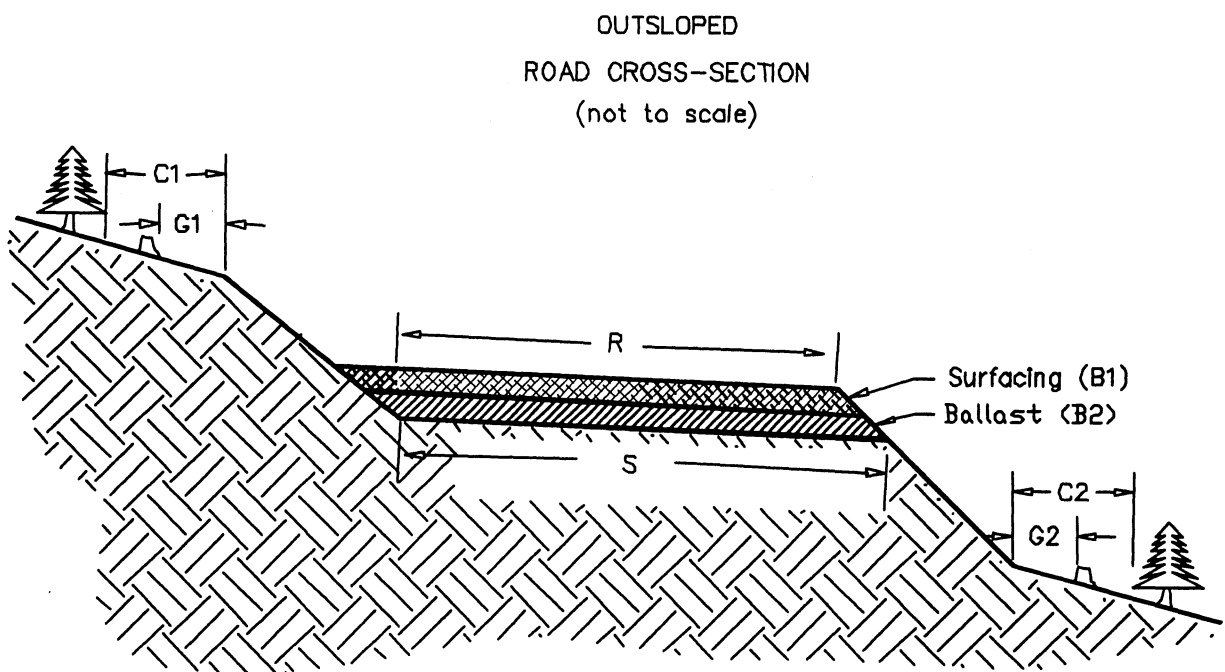
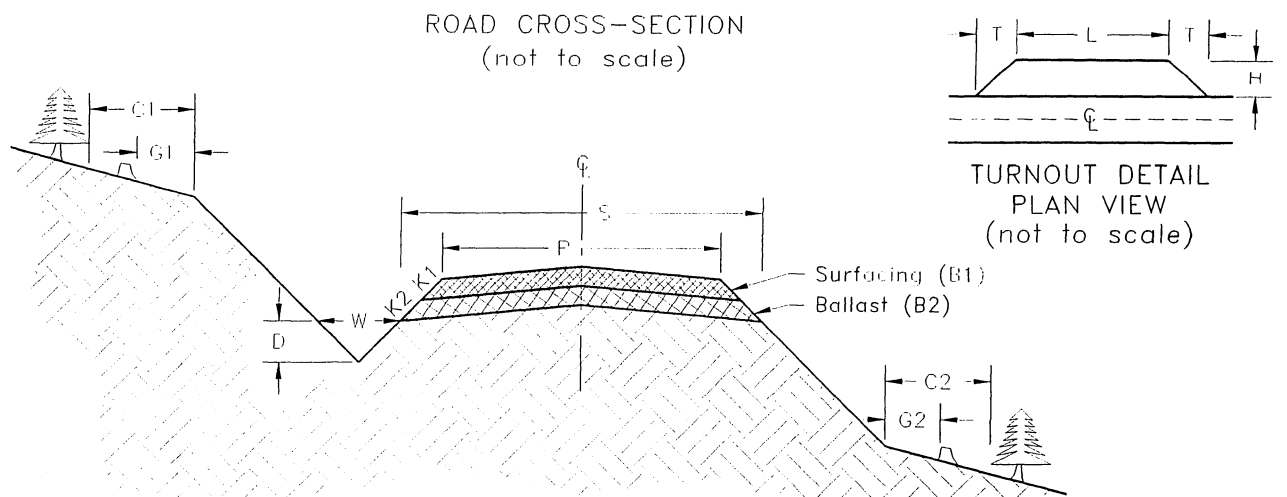


Road Number	From Station	To Station	Tolerance Class	Subgrade Width (feet)	Road Width (feet)	Ditch		Crown in. @ CL	Grubbing Limits (feet)		Clearing Limits (feet)		Cut Slope Ratio	Fill Slope Ratio
						Width (feet)	Depth (feet)		G1	G2	C1	C2		
				S	R	W	D						%	%
921	0+00	23+29	C	13	10	2	1	4	2	2	5	5	100	67
921	23+29	33+82	C	13	10	2	1	4	2	2	5	5	100	67
924	0+00	38+72	C	15	12	3	1	4	2	2	tags	tags	100	67
924	38+72	40+42	C	15	12	3	1	4	5	5	10	10	100	67
9242	0+00	3+36	C	13	10	2	1	4	2	2	5	5	100	67
9242	3+36	8+42	C	13	10	2	1	4	2	2	tags	tags	100	67

OUTSLOPED
ROAD CROSS-SECTION
(not to scale)



Road Number	From Station	To Station	Tolerance Class	Subgrade Width (feet)	Road Width (feet)	Ditch		Crown in. @ CL	Grubbing Limits (feet)		Clearing Limits (feet)		Cut Slope Ratio	Fill Slope Ratio
						Width (feet)	Depth (feet)		G1	G2	C1	C2		
				S	R	W	D						%	%
9241	0+00	5+72	C	12	10	--	--	3-5% Outslope	0	0	tags	tags	100	67
Spur 1	0+00	2+00	C	12	10	--	--	3-5% outslope	0	0	2	2	100	67



ROCK LIST

BALLAST

Road Number	From Station	To Station	Rock Slope	Compacted Rock Depth	C.Y./ Station	# of Stations	C.Y. Subtotal	Rock Source	Turnout		
									Length	Width	Taper
			K2	B2	4 Inch In Place				L	H	T
921	0+00	23+92	1.5:1	6"	20	24	480	Primo Pit	50	10	25
921	23+29	33+82	1.5:1	12"	43	11	473	Primo Pit			
924	0+00	40+42	1.5:1	12"	50	40	2000	Primo Pit			
9242	0+00	8+42	1.5:1	12"	43	8	344	Primo Pit			
9241*	0+00	5+72	1.5:1	9"	30	6	180	Primo Pit			
Spur 1*	0+00	2+00	1.5:1	9"	30	2	60	Primo Pit			

*Optional rock

BALLAST TOTAL 3689 Cubic Yards

If Purchaser elects to haul on optional rock roads in wet weather, the depth listed above is recommended but not required.

NOTE: Yardages are estimated on a compacted (In-Place) basis. Compliance of required rock will be based on compacted depth measurement.

Last exist CMP on 921rd
1901.0

302 2067.3

303 2178.7

2225.6

304 2290.2

303 2326.2

303 8.8242

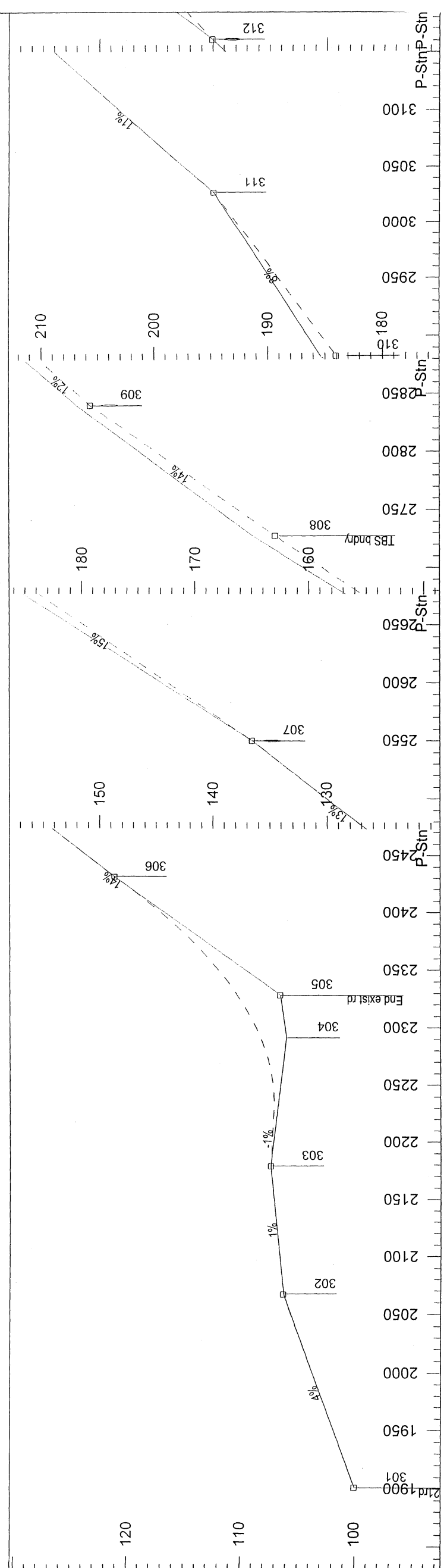
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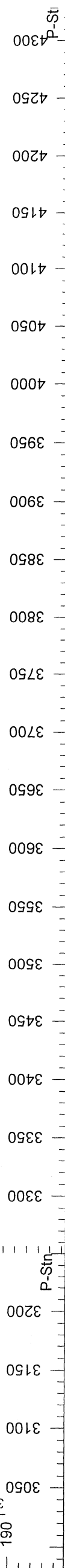
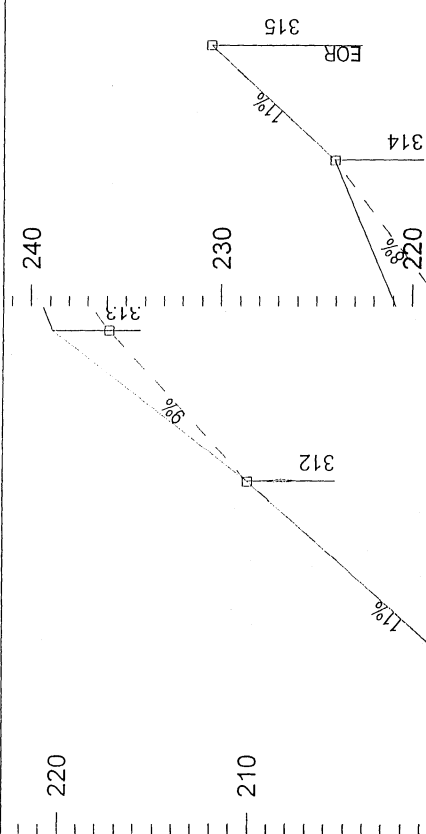
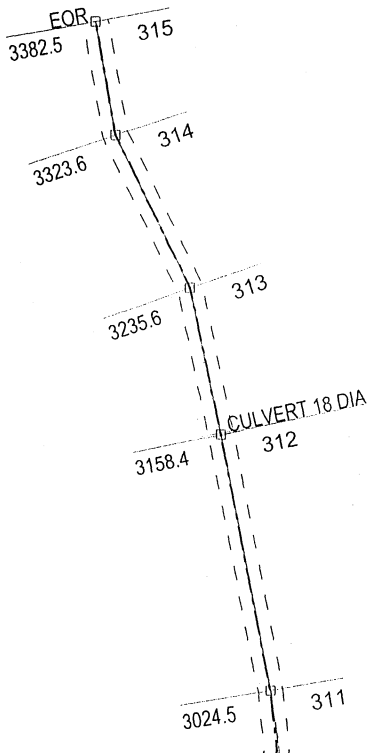


Brainstrain Timber Sale
921 RD February 9, 2004
Contract #: 30-075799

Washington State Department of Natural Resources
South Puget Sound Region

Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

Engineer: M. Bell
04/02/24
Page 1 of 2

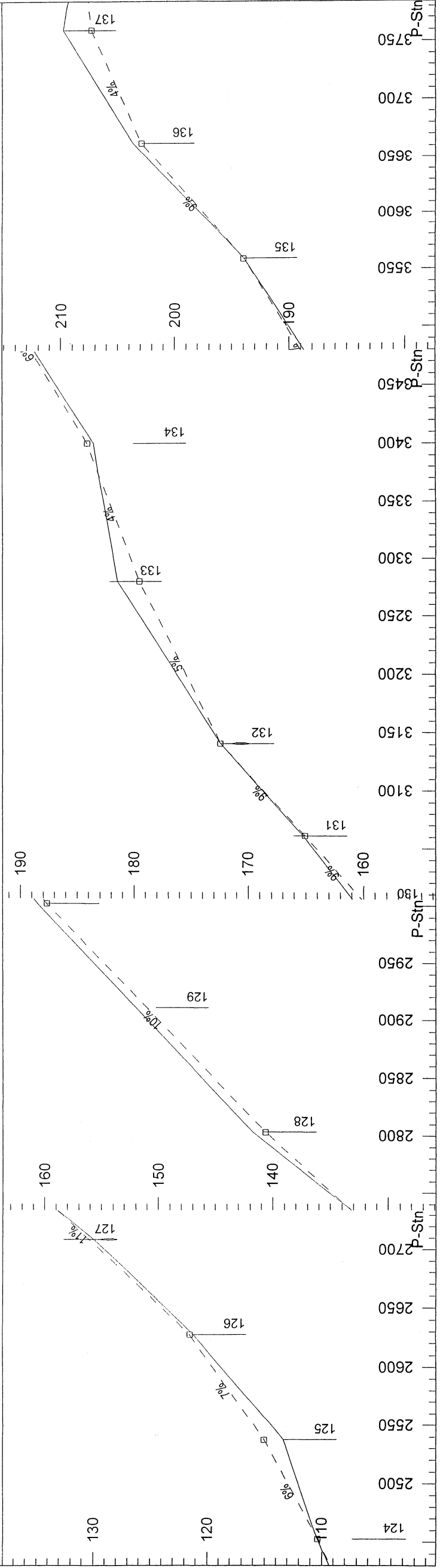
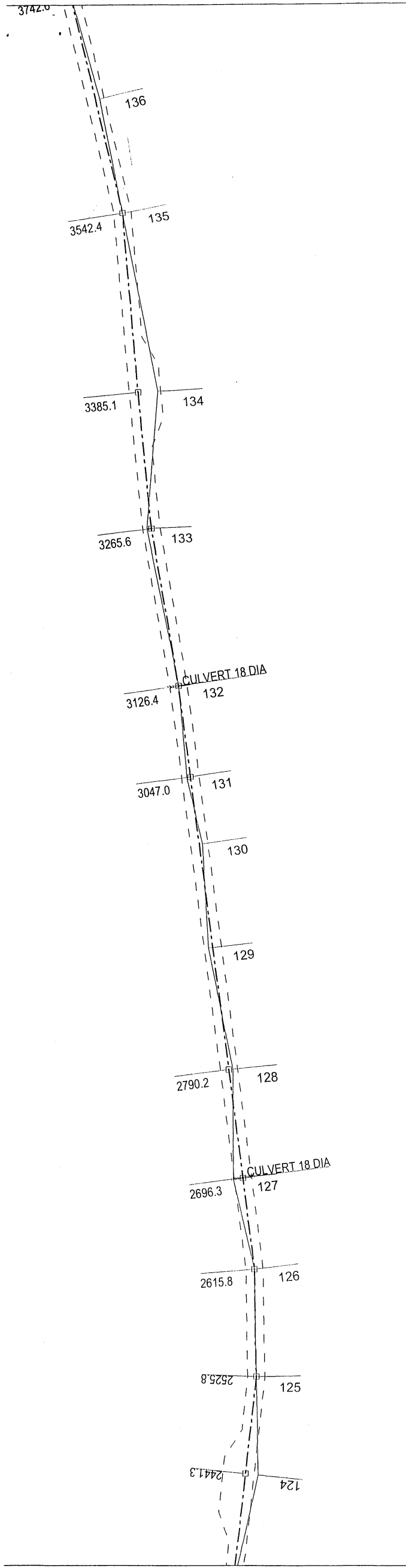


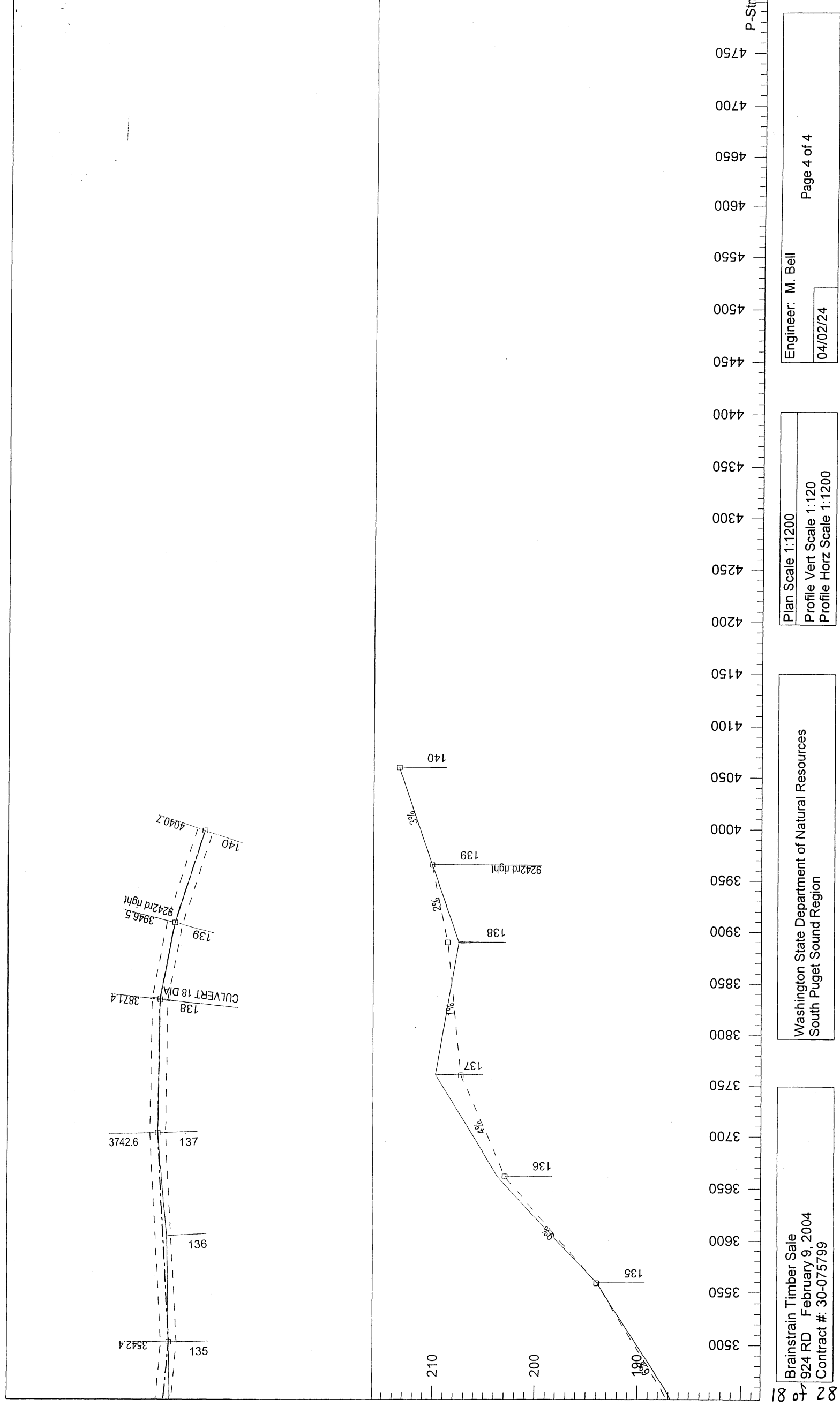
Brainstrain Timber Sale
921 RD February 9, 2004
Contract #: 30-07/5799

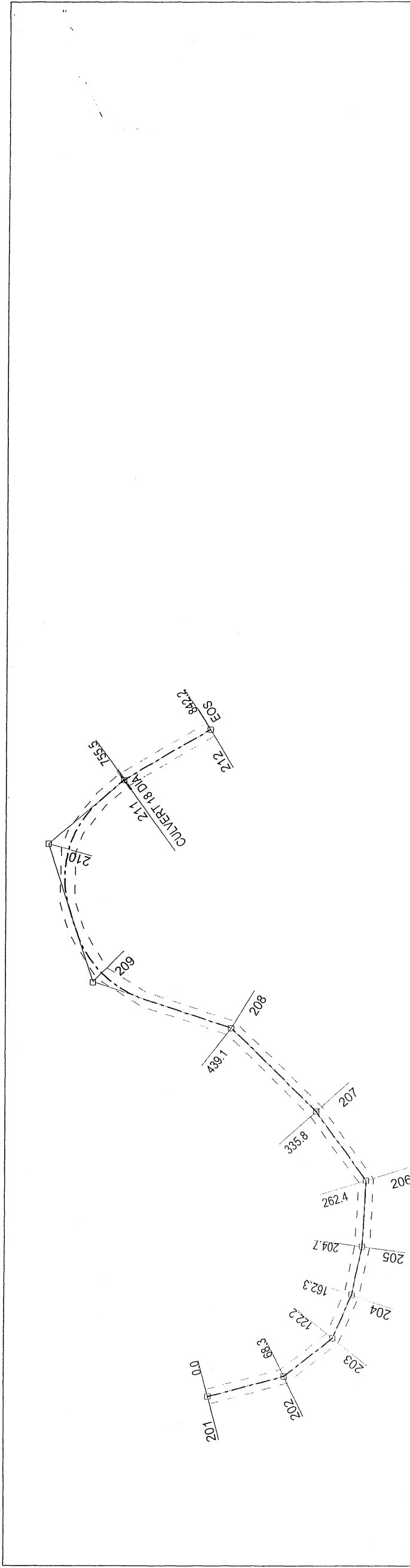
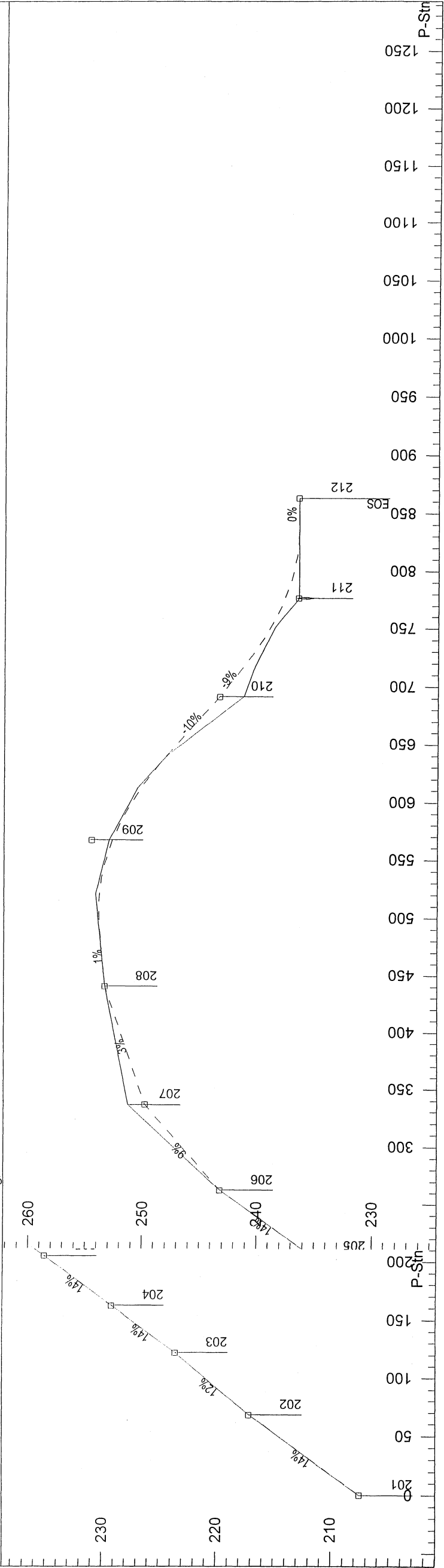
Washington State Department of Natural Resources
South Puget Sound Region

Plan Scale 1:1200
Profile Vert Scale 1:120
Profile Horz Scale 1:1200

Engineer: M. Bell
04/02/24







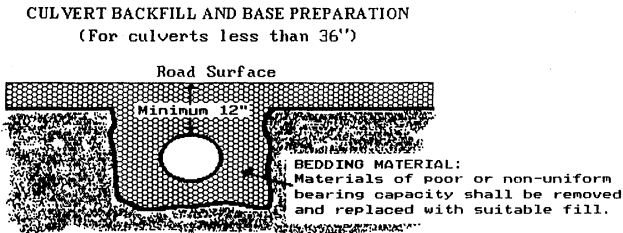
CULVERT LIST

Road Number	Location	Culvert		Length (ft)			Riprap (C.Y.)			Backfill Material	Placement Method	Const. Staked	Remarks
		Dia.	Type	Culvert	Downspt	Flume	Inlet	Outlet	Type				
92	21+00	18"	PD	34'			0.2	0.2	QS or SR				Junction w/ 921 rd
92	83+46	18"	PD	36'			0.2	0.2	QS or SR				Junction w/ 924 rd
921	0+00	--	--	--									Remove culvert in ditchline of 92 rd
	11+50	18"	PD	30'			0.2	0.2	QS or SR				
	25+48	18"	PD	30'			0.2	0.2	QS or SR				
	28+40	18"	PD	30'			0.2	0.2	QS or SR				
	31+58	18"	PD	30'			0.2	0.2	QS or SR				
924	4+38	18"	PD	30'			0.2	0.2	QS or SR				
	12+60	18"	PD	30'			0.2	0.2	QS or SR				
	12+99	36"	AS14	30'			0.2	0.2	QS or SR				
	19+00	18"	PD	30'			0.2	0.2	QS or SR				
	26+96	18"	PD	30'			0.2	0.2	QS or SR				
	31+26	18"	PD	30'			0.2	0.2	QS or SR				
	38+71	18"	PD	30'			0.2	0.2	QS or SR				
9242	7+55	18"	PD	30'			0.2	0.2	QS or SR				Place in 92 rd ditchline.
Spur 1	0+00	18"	TEMP	30'									

PD = Polyethylene Pipe Dual Wall AASHTO No. M294 Type S
GS16 = Galvanized Steel AASHTO No. M36, 16 Gauge
AS14 = Aluminized Steel AASHTO No. M274, 14 Gauge
TEMP = Temporary Culvert

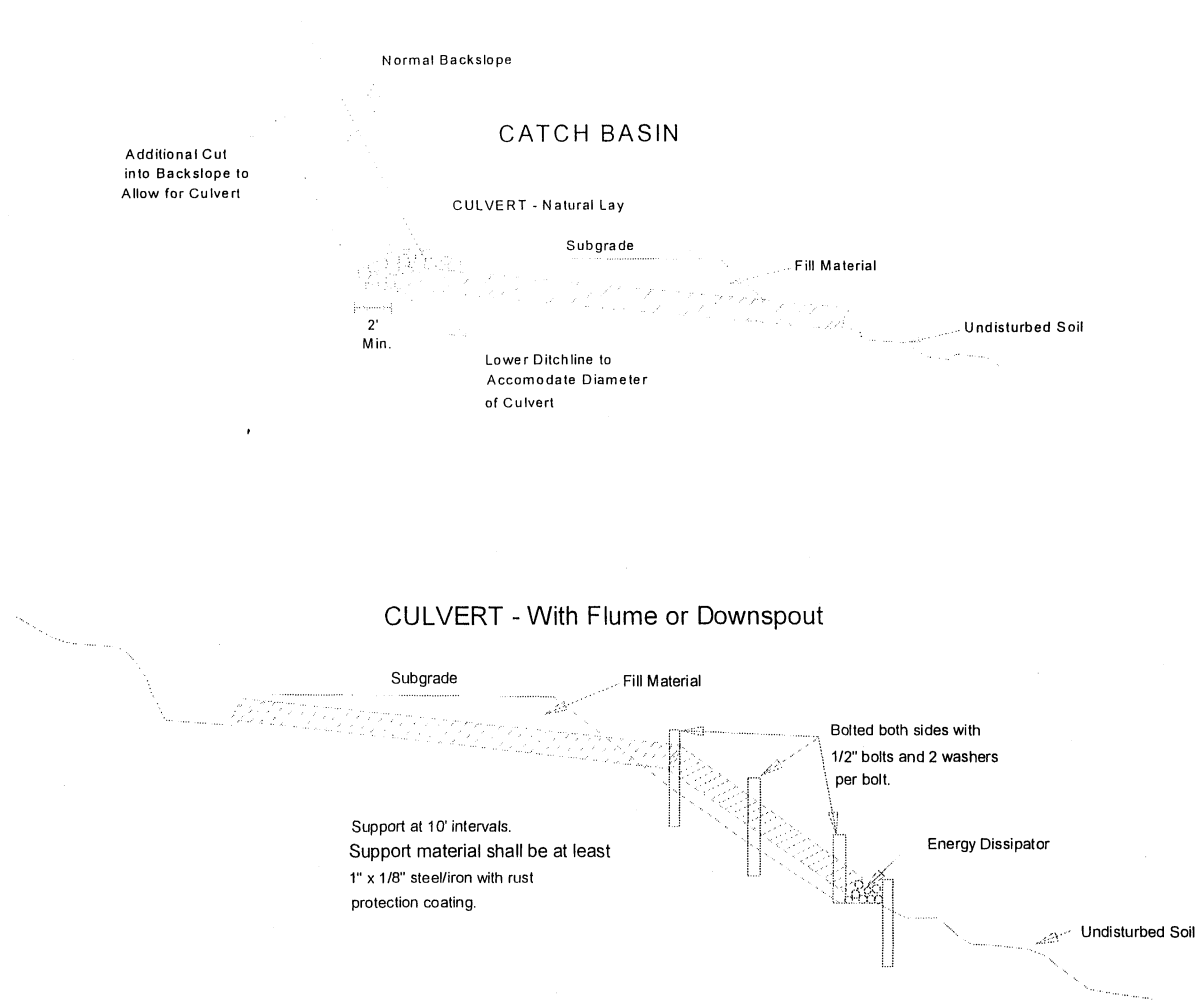
Key:

- QS - Quarry Spalls
- SR - Shot Rock
- NT - Native (bank run)
- SL - Select Fill
- HL - Heavy Loose Riprap
- LL - Light Loose Riprap
- Flume - Half round pipe
- Downspout - Full round pipe

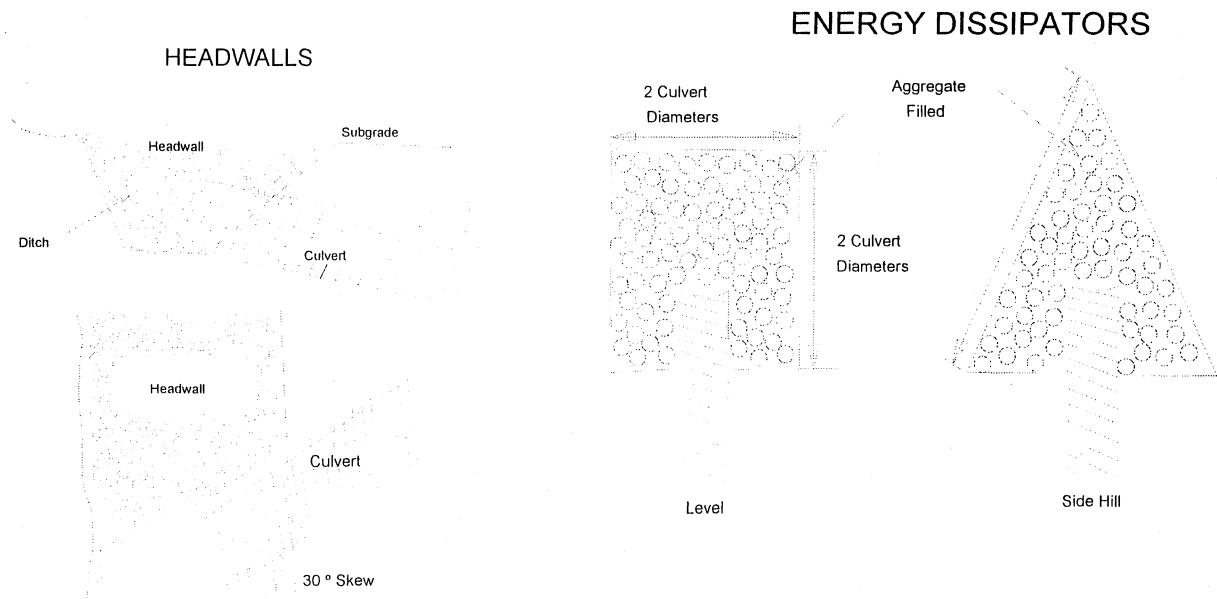


CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 1 of 2)



Proper preparation of foundation and placement of bedding material shall precede the installation of all culvert pipe. This includes necessary leveling of the native trench bottom and compaction of required bedding material to form a uniform dense unyielding base. The backfill material shall be placed so that the pipe is uniformly supported along the barrel.



Headwalls to be constructed of material that will resist erosion.

Dissipator Specifications:
Depth: 1 culvert diameter
Aggregate: as specified in the CULVERT LIST.

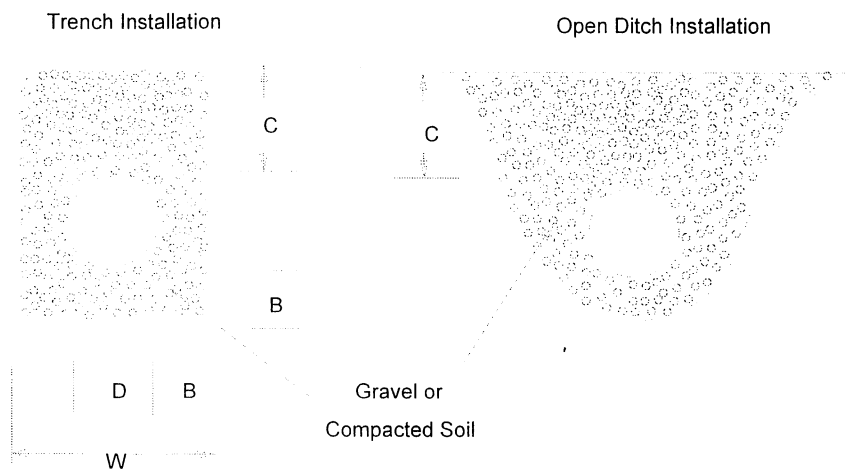
CULVERT AND DRAINAGE SPECIFICATION DETAIL

(Page 2 of 2)

POLYETHYLENE PIPE INSTALLATION

INSTALLATION REQUIREMENTS:

- 1. Crushed stone, gravel, or compacted soil backfill material shall be used as the bedding and envelope material around the culvert. The aggregate size shall not exceed 1/6 pipe diameter or 4" diameter, whichever is smaller.
- 2. The corrugated pipe shall be laid on grade, on a layer of bedding material as shown for the two types of installations. If native soil is used as the bedding and backfill material, it shall be well compacted in six inch layers under the haunches, around the sides and above the pipe to the recommended minimum height of cover.
- 3. Either crushed aggregate or flexible (asphalt) pavement may be laid as part of the minimum cover requirements.
- 4. Site conditions and availability of bedding materials often dictate the type of installation method used.
- 5. The load bearing capability of flexible conduits is dependent on the type of backfill material used and the degree of compaction achieved. Crushed stone and gravel backfill materials typically reach a compaction level of 90-95% AASHTO standard density without compaction. When native soils are used as backfill material, a compaction level of 85% is required. This minimum compaction can be achieved by either hand or mechanical tamping.



MINIMUM DIMENSIONS
Trench or Open Ditch Installation

Nominal Diameter	Minimum Thickness	Minimum Cover	Min. Trench Width
D	B	C	W
18"	6"	12"	36"
24"	6"	12"	42"
30"	6"	12"	48"
36"	6"	12"	54"

STATE OF WASHINGTON
DEPARTMENT OF NATURAL RESOURCES

FOREST ACCESS ROAD
MAINTENANCE SPECIFICATIONS

1. CONSTRUCTION AND RECONSTRUCTION (Prior to acceptance to the contract or acceptance on a timber sale).

A. Cuts and Fills

1. Maintain slope lines as constructed. Remove slides from the ditches and roadway. Replace fills to 1 ½ : 1 slopes with selected material or as directed. Remove overhanging material from the cut slopes.
2. Material from slides or other sources requiring removal shall not be deposited in streams or at locations where it will erode into streams or water courses.
3. Undesirable slide materials and debris shall not be mixed into the surface material.

B. Surface

1. Grade and shape the road surface, turnouts, and shoulders to the original crown, inslope or outslope as directed to provide suitable traveled surface and surface water runoff in an even, unconcentrated manner.
2. Blading must not undercut the backslope at the bottom of the ditchline or cut geotextile at centerline.
3. Watering may be required to control dust and to retain fine surface rock.
4. Desirable surface material shall not be bladed off the roadway.
5. Replace surface material lost or worn away.
6. Remove berms except as directed by the State.
7. Barrel spread soft spots to prevent degradation of geotextile.

C. Drainage

1. Keep ditches and drainage channels at outlets and inlets of culverts clear of obstructions and functioning as intended.
2. Inspect and clean culverts at least monthly, with additional inspections during storms and periods of high runoff. This must be done even during periods of inactivity.
3. Add stable material at the outlet end of the culvert as needed to stabilize the stream bed.
4. Headwalls: maintain to the road shoulder level with material that will resist erosion.
5. Keep silt bearing surface runoff from getting into live streams.

D. Structures

Repair bridges, culverts, cattleguards, fences, and other road structures to the condition required by the construction specifications.

E. Termination of Use or End of Season

Do maintenance work to minimize damage from the elements such as blading to insure correct runoff, ditch, and culvert cleaning and water bars.

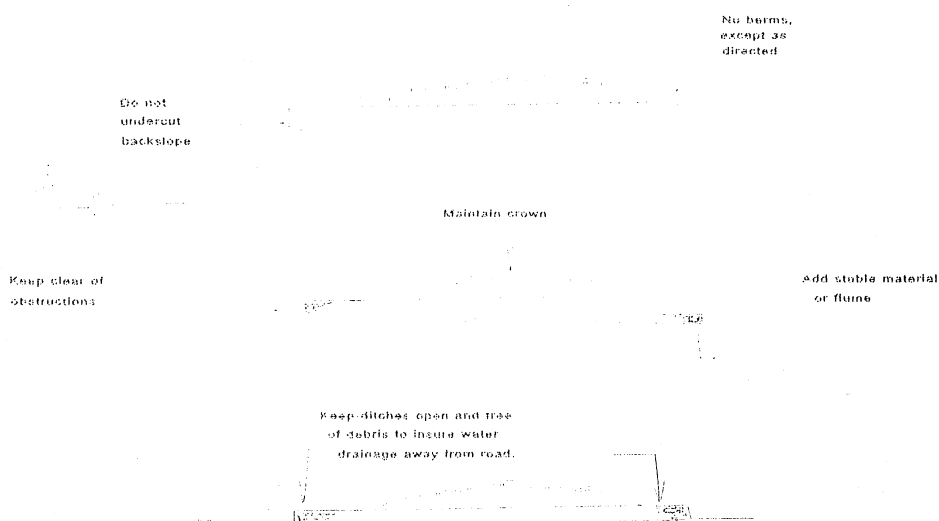
F. Debris

Remove fallen timber, limbs, and stumps from the slopes or roadway.

2. Existing Roads – Timber Sale, Operator Maintained

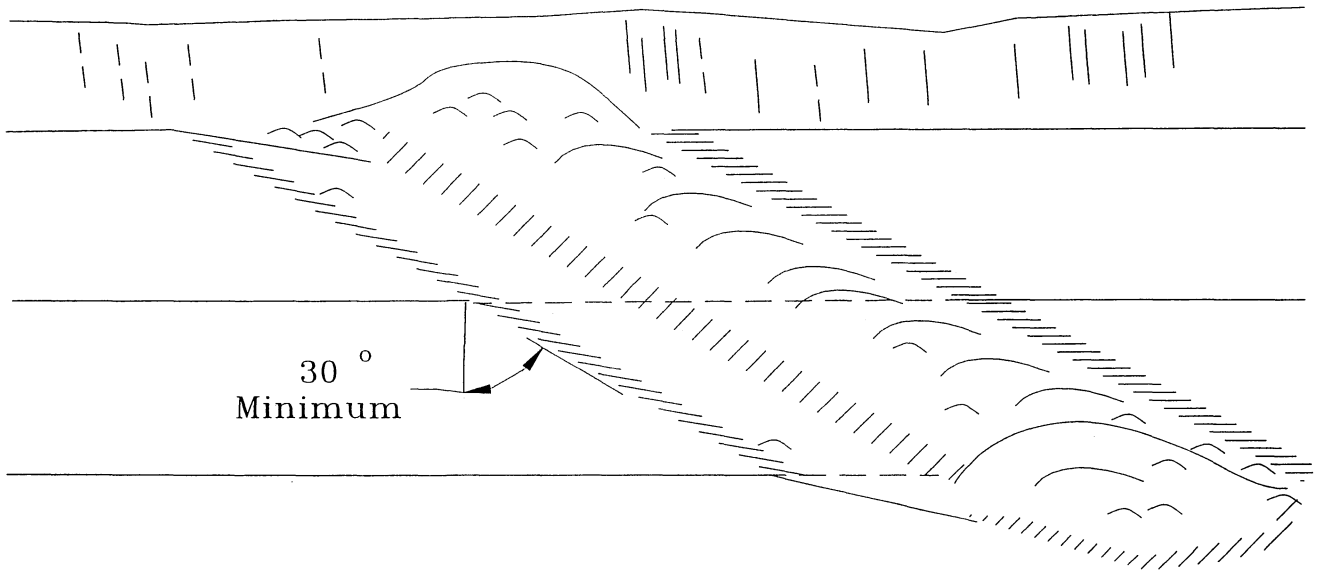
- A. Same as above but not to exceed the condition of the road on the date the contract was signed.

3. A.R.R.F. – Directed maintenance to comply with these specifications.

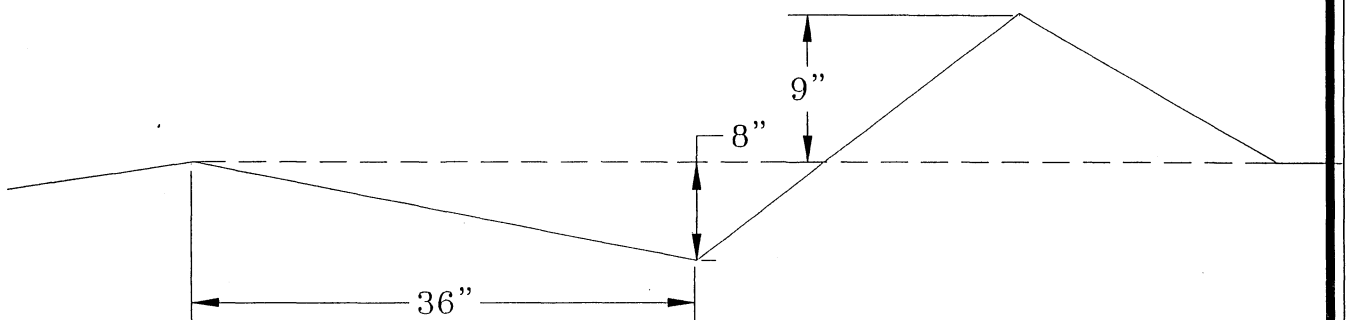


Drivable Water Bar Detail

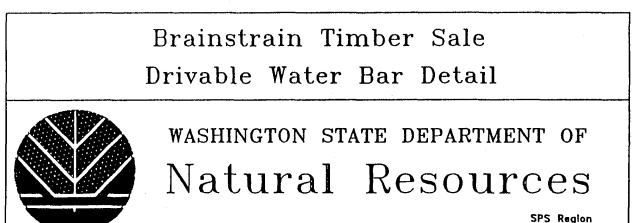
Cross Ditch



Cross Section at Centerline

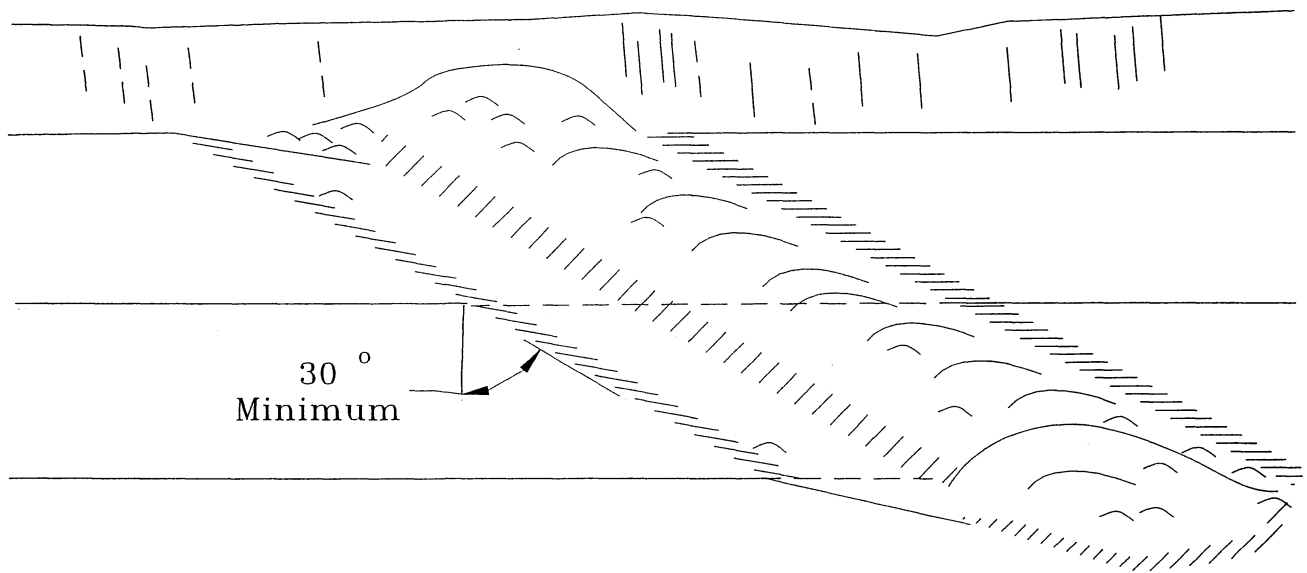


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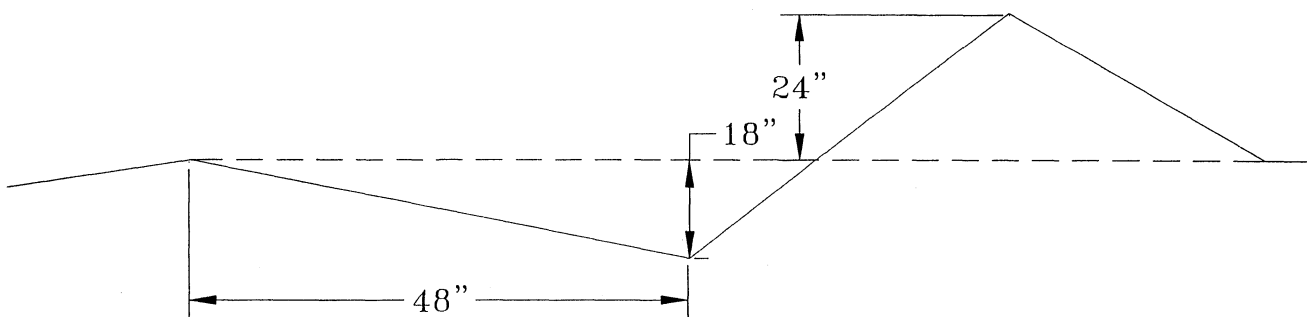


Non-Drivable Water Bar Detail


Cross Ditch



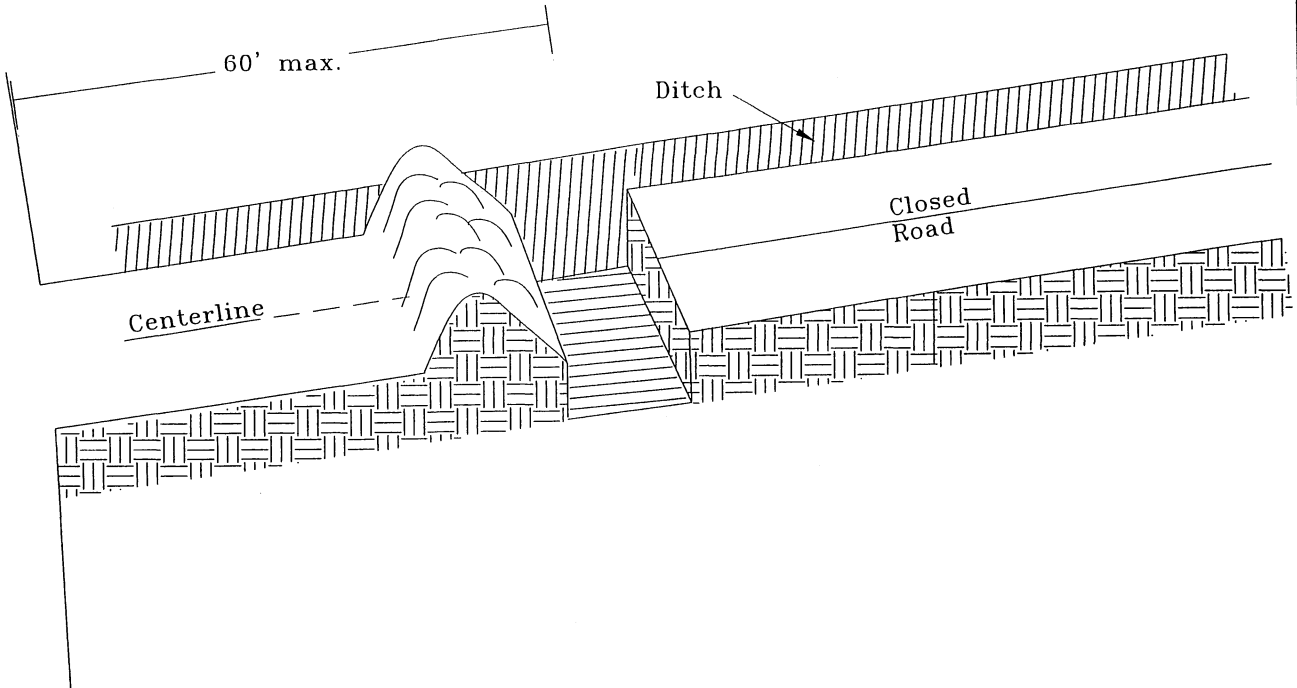
Cross Section at Centerline



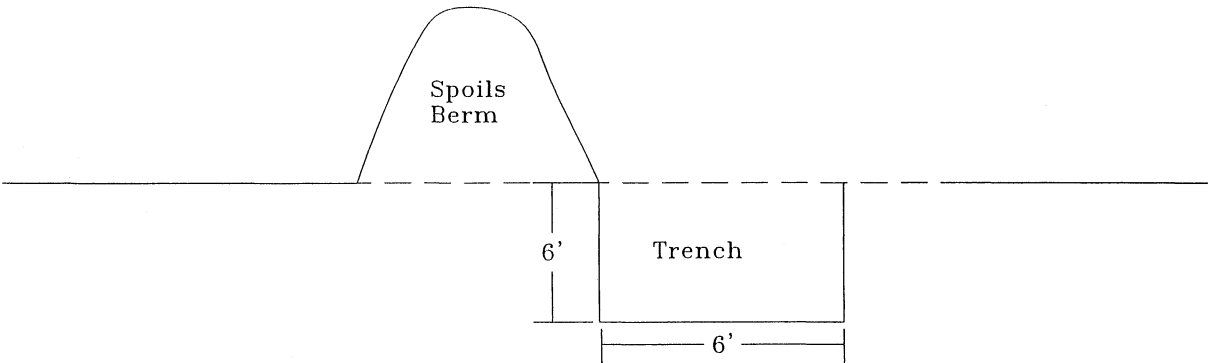
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Drawn by: M.A.D.

Brainstrain Timber Sale Non-Drivable Water Bar Detail	
	WASHINGTON STATE DEPARTMENT OF Natural Resources
<small>SPS Region</small>	


Single Tank Trap Detail



Cross Section at Centerline



Scale : None
 Drawn by: M.A.D.

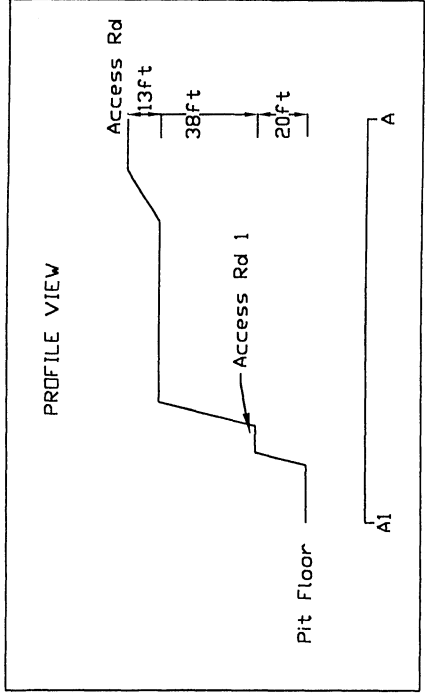
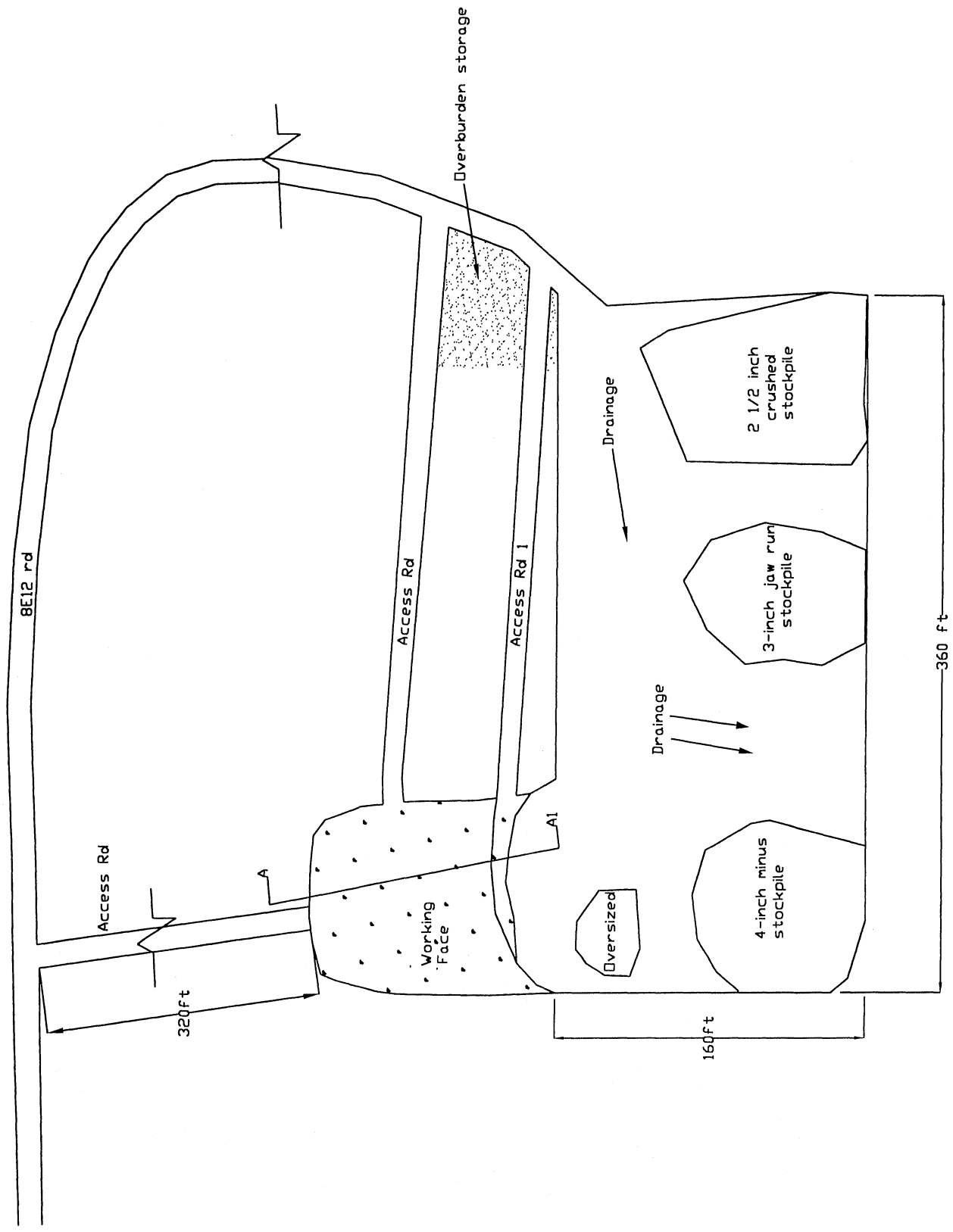
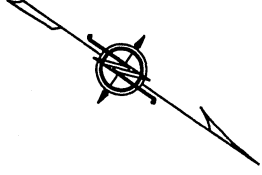
Brainstrain Timber Sale Tank Trap Detail	
	WASHINGTON STATE DEPARTMENT OF Natural Resources
	<small>SPS Region</small>

Legal Description: NE1/4 SW1/4, Section 20, T15N, R6E, W.M.

Rock Pit Name: Primo Pit

PIT DEVELOPMENT PLAN

1. Scatter debris as directed by the Contract Administrator.
2. A minimum stripping width of 10 feet must be maintained from all pit faces and at the termination of operations pit shall be left in said condition.
3. Pile all reject rock and overburden away from pit working area as directed by the Contract Administrator
4. Pit floor shall be sloped to allow drainage as shown. No ponding will be allowed.
5. Maximum face height will be no greater than what can be reached by the excavating equipment.
6. At the termination of use the pit face shall have a maximum backslope of $\frac{1}{4}$: 1.
7. At the termination of use all overburden shall have a maximum backslope of 1 $\frac{1}{2}$: 1.
8. Quantity and Quality of ballast pit is not guaranteed by the State.



Primo Pit Plan
Brainstrain Timber Sale
NE1/4 SW 1/4 Section 20 T15N R08E
Plan and Profile View
Contract #. 30-075799

WASHINGTON STATE DEPARTMENT OF
Natural Resources
SPS Region

Date: 2/19/04
Scale : 1" = 75'
Drawn by: M.D.B.